

**Preliminary Amendment**

Applicant: Ian P. Shaeffer et al.

Filed: Herewith

Docket No.: 10002500-2

Title: PRINTED CIRCUIT BOARD HAVING SOLDER BRIDGES FOR ELECTRONICALLY CONNECTING CONDUCTING PADS AND METHOD FOR FABRICATING SOLDER BRIDGES

**Divisional Application of:**

Applicant: Ian P. Shaeffer et al.

Serial No.: 09/561,591

Filed: May 1, 2000

Docket No.: 10002500-1

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**IN THE SPECIFICATION**

Please replace the paragraph beginning at page 4, line 10 with the following re-written paragraph:

**Summary of the Invention**

The present invention is a printed circuit board product comprising a dielectric structure core having a first surface. At least two conducting pads are located on the first surface of the dielectric structure core. The at least two conducting pads are separated by a pad edge to pad edge separation distance of less than 12 mils.

In one aspect of the present invention the pad edge to pad edge separation distance is 8 mils. In another aspect of the present invention, the at least two conducting pads are defined by a first conducting pad having an edge and a second conducting pad having an edge. The edge of the second conducting pad is separated from but adjacent to the edge of the first conducting pad such that the edges of the first and second conducting pads define therebetween a surface area of the first surface of the dielectric structure core. In a further aspect of the present invention, a solder bridge at least partially covers this surface area to form a substantially zero signal degradation electrical connection between the first and second conducting pads. In still another aspect of the present invention, the solder bridge covers substantially all of the surface area of the first surface of the dielectric structure core defined between the edges of the first and second conducting pads.

In another embodiment, the present invention provides a printed circuit board product comprising a dielectric structure core having a first surface. At least two conducting pads are located on the first surface of the dielectric structure core. A solder bridge electrically connects the at least two conducting pads.

In a further embodiment, the present invention provides a method of fabricating a substantially zero signal degradation electrical connection on a printed circuit board. The method includes providing a printed circuit board defined by a dielectric structure core having a first surface. The first surface includes a first conducting pad having an edge and a

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~~second conducting pad having an edge separated from and adjacent to the edge of the first conducting pad. The edges of the first and second conducting pads define therebetween a surface area of the first surface. The method further includes applying a solder paste on the first and second conducting pads and on the first surface of the dielectric structure core. The solder paste at least partially covers the surface area of the first surface between the edges of the first and second conducting pads to form a substantially zero signal degradation electrical connection between the first and second conducting pads.~~

~~In one aspect of the invention, the solder paste covers the entire surface area of the first surface between the edges of the first and second conducting pads. In another aspect of the invention, the solder paste is applied through an opening within a stencil that has been placed atop the first surface of the dielectric structure core.~~

~~In still another embodiment, the present invention provides a stencil device for insuring that solder paste is accurately applied to a printed circuit board to create a substantially zero signal degradation solder bridge electrical connection. The printed circuit board is defined by a dielectric structure core having a first surface. The first surface includes a first conducting pad having an edge and a second conducting pad having an edge separated from and adjacent to the edge of the first conducting pad. The edges of the first and second conducting pads define therebetween a surface area of the first surface. The stencil device comprises a stencil plate member defining a first opening sized to substantially correspond to the first conducting pad, a second opening sized to substantially correspond to the second conducting pad and a third opening that links the first opening to the second opening and is sized to correspond to a partial portion of the surface area of the first surface between the edges of the first and second conducting pads. Upon application of solder paste to the stencil plate member, the solder paste flows through the first, second and third openings onto the first and second conducting pads and the first surface of the dielectric structure core to form a substantially zero signal degradation electrical connection between the first and second conducting pads.~~

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~~In still a further embodiment, the stencil plate member defines an opening sized to substantially correspond to the first conducting pad, the second conducting pad and substantially the entire surface area of the first surface between the edges of the first and second conducting pads. Upon application of solder paste to the stencil plate member, the solder paste flows through the opening onto the first and second conducting pads and the first surface of the dielectric structure core to form a substantially zero signal degradation electrical connection between the first and second conducting pads.~~

~~The method of fabricating a zero signal degradation solder bridge electrical connection for connecting conducting pads of a printed circuit board, and a printed circuit board having at least one of these solder bridges of the present invention does not require the use of separate electrical components (such as "zero ohm resistors", "dip switches" and "header array/jumper blocks"). As such the cost of fabricating such a printed circuit board is reduced. In addition, since this zero signal degradation solder bridge electrical connection has such a low profile, it is not susceptible to damage during routine handling, nor is it susceptible to becoming dislodged or inadvertently misaligned during the printed circuit board manufacturing process. Moreover, since the zero signal degradation solder bridge electrical connection forms a short, direct electrical connection between the conducting pads, degradation of the integrity of the electrical signal and parasitic capacitance and inductance between connected conducting pads is minimized especially when compared to the separate electrical components referred to above. Further, it is relatively easy to reconfigure the printed circuit board during the manufacturing process since the reconfiguring of any zero signal degradation electrical connections only requires modification of the stencil which may in some instances be accomplished simply by masking off with tape unwanted solder bridge connections on the stencil. Lastly, these substantially zero signal degradation electrical connections are rotatable through any angle so as to be mountable to the printed circuit board at any angle (not just 90° and 180°) to allow the printed circuit board to employ various conducting pad geometries and groupings to take advantage of available printed circuit board~~

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surface space. A method of fabricating a substantially zero signal degradation electrical connection on a printed circuit board includes providing a printed circuit board defined by a dielectric structure core. The dielectric structure core has a first surface, which includes a first connecting pad having an edge and a second connecting pad having an edge separated from an adjacent to the edge of the first conducting pad. The edges of the first and second conducting pads define therebetween a surface area of the first surface. A solder paste is applied on the first and second conducting pads and on the first surface of the dielectric structure core. The solder paste at least partially covers the surface area of the first surface between the edges of the first and second conducting pads, thereby forming a substantially zero signal degradation electrical connection between the first and second conducting pads.